



# Prairie Preamble

The official newspaper  
of Badlands National Park

Summer 2004 Issue

## Conservation Comes of Age

PEOPLE TRAVEL TO NATIONAL PARKS TO WITNESS INCREDIBLE SCENERY, watch wildlife or learn about the stories of our past. While many associate the National Park Service as a conservation agency, few realize how involved this task is in the 21<sup>st</sup> century.

Yellowstone was established as our first National Park in 1872, but it would take many years to develop an understanding of how to manage our national parks. Early national parks were established around scenic features or for political reasons. The idea of protecting intact ecological units was unheard of. Words like ecosystem had not been invented. Many resource management mistakes were made. Predator control programs eliminated animals deemed “bad” such as wolves, cougars, coyotes and other predators. Numbers of popular animals such as deer and elk were boosted. At some parks, bears were fed garbage while visitors watched from bleachers. As our understanding of ecological principles grew, however, the role of national parks evolved from being curiosities of nature to places containing complex natural systems. Scientific studies taught us about relationships such as predator and prey, geologic effects on the landscape or the role of fire in returning nutrients to the soil. Today, we still continue to learn and are sometimes surprised by the results we find.

We have come to realize that parks are not isolated islands. Because boundaries were originally drawn around scenic features, places like Badlands National Park rarely contain complete ecological units. Plants and animals are often dependent on land and habitats outside our boundaries for their survival. This is why it is vitally important for resource managers to form partnerships with other state and federal land management agencies, tribes and private landowners. It is far easier to preserve a species and its habitat than to conduct restoration efforts after reaching a critical level.

Another important idea learned is that the area within park boundaries can be greatly affected by occurrences outside, even if they happen long distances away. Air, water, plants and animals, including native and non-native species, do not recognize political boundaries drawn on a map. For this reason, laws that help to manage resources on a larger scale are important to national parks.

In December 2003, the Endangered Species Act celebrated the 30th anniversary of its passage. This was the first law to give all species a right to exist and applied rules for species management across all government agencies. Another important law, the Wilderness Act of 1964, will celebrate its 40th anniversary in September 2004. This law looked across the four primary federal land management agencies and set aside areas “*where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain ...*” This was the first time it was federally legislated that



**top:** A Badlands National Park biological technician conducts field research during release of insects as biocontrol agents.



**bottom:** Park staff ride into the Badlands Wilderness area to conduct mapping of exotic plants with Global Positioning System (GPS) units on their backs.

areas would be forever protected from development. These two laws along with others like the Clean Air Act play an important role in helping to manage and protect Badlands National Park for future generations. Some of these laws were controversial when originally passed and remain so today, but they ensure that all of us are stakeholders in the way our nation’s resources are managed.

As you read through articles further in this newspaper, pay special attention to where either partnerships or legislation has been involved in our resource management efforts. National parks have played an important role in the management and stewardship of our nation’s natural and cultural legacy but they are just one part of the intricate task of preserving this legacy for the future.

*By Dan Johnson, a former park ranger at Badlands National Park, now at Keweenaw National Historical Park.*

### Welcome from the Superintendent

Welcome to Badlands National Park. Depending on when you visit the park in 2004, you may notice some big changes. The Ben Reifel Visitor Center, built in 1958, will begin a major face lift with new exhibits, the addition of an auditorium for our new park orientation film now in production and a modern classroom to support our education programs. During construction the visitor center and Badlands Natural History Association bookstore will be available in temporary offices. Look for signs directing you to the temporary location. If construction progresses as scheduled, you should find us back at the rehabilitated visitor center in fall 2005.

The Badlands are known around the world for dramatic vistas, fossil resources and solitude seldom found in our urban lifestyles. While you are here, please take time to get out of your car to experience the prairie, pinnacles and other diverse resources of Badlands National Park. Please make good use of my team of rangers, volunteers, maintenance workers and park partners who work together to provide a safe and educational visit for over one million visitors each year.

Badlands National Park ([www.nps.gov/badl](http://www.nps.gov/badl)) is working on a revised General Management Plan and the first General Management Plan for Minuteman Missile National Historic Site ([www.nps.gov/mimi](http://www.nps.gov/mimi)) is also underway. Please visit our websites for information on how you can be a part of their future.

Enjoy your stay at your park!

*William R. Supernauth*  
William R. Supernauth,  
Superintendent



For the latest on what is happening at Badlands National Park, check out the park website at [www.nps.gov/badl](http://www.nps.gov/badl)


Emergency?  
Call 911

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National Park Service

U.S. Department of the Interior

Badlands National Park

Badlands National Park protects over 244,000 acres of sculpted Badlands and mixed-grass prairie. The park is home to a variety of plants and animals. The Badlands formations also contain fossils of creatures that roamed the land millions of years ago.

For thousands of years this seemingly harsh land has been a home for many peoples. Today, the vibrant culture of the Oglala Lakota remains alive on the Pine Ridge Indian Reservation which contains the Stronghold Unit of Badlands National Park. Ranches dot the countryside outside the park. Some are owned by descendants of original homesteaders who settled here.

Mailing Address

Badlands National Park  
25216 Ben Reifel Road  
PO Box 6  
Interior, South Dakota 57750

Park Website

www.nps.gov/badl

Email

badl\_information@nps.gov

Fax Number

(605) 433-5404


Park Headquarters

(605) 433-5361

The National Park Service cares for the special places saved by the American people so that all may experience our heritage.


# Visitor Facilities

## Ben Reifel Visitor Center

 Located at Cedar Pass, the Ben Reifel Visitor Center offers a staffed information desk, the park orientation movie, exhibits, restrooms, water and a public telephone. Badlands Natural History Association sells postcards, books, videos, posters and other educational materials. Open year round except for Thanksgiving, December 25 and January 1. Note: The park is about to begin a major visitor center renovation project. When renovations begin, a temporary contact station will serve as the visitor center. See article on page 5.


Hours of Operation	
January 1–May 29	9 a.m.–4 p.m.
May 2–September 6	8 a.m.–5 p.m.
September 7–April 2005	9 a.m.–4 p.m.
Badlands National Park is in the Mountain Time Zone	

## White River Visitor Center



 Located on the Pine Ridge Reservation off Highway 27, the White River Visitor Center offers a staffed information desk, the park orientation movie, exhibits, restrooms and water. Badlands Natural History Association operates a small sales outlet that includes postcards and books.

Hours of Operation	
June 6–August 25	10 a.m.–4 p.m.

## Picnic Areas

 Picnic tables are located at Bigfoot Pass and Conata Picnic Areas in addition to tables at the park’s visitor centers. Bigfoot Pass and Conata Picnic Areas do not have water available. Remember that open campfires are **not** permitted.


## Cedar Pass Campground

 Located near the Ben Reifel Visitor Center, the Cedar Pass Campground has 96 sites. Summer camping fees are \$10 per night per campsite. The campground is operated on a first come, first served basis and has a fourteen day limit. Cold running water, flush toilets, covered picnic tables and trash containers are available. The campground does not have showers or electrical hookups. A dump station is available with a \$1.00 fee per use. Campground hosts are on duty during the summer to assist in registration and provide information. Look for them in the afternoon and early evenings at the campground entrance booth. Open campfires are **not** permitted.


### GROUP CAMPING

Four campsites are available in the Cedar Pass Campground for organized groups with a designated leader. The nightly fee is \$2.50 per person with a minimum fee of \$25.00. Advance reservations are required and can be made by contacting (605) 433 – 5235 or by writing Group Camping Reservations, Badlands National Park, 25216 Ben Reifel Road, PO Box 6, Interior, South Dakota 57750

## Sage Creek Primitive Campground


 Open year round, access to this campground may be limited in winter or during the spring rainy season due to road conditions. The Sage Creek Rim Road is remote and unpaved. It is not recommended for large recreational vehicles. The Sage Creek campground is currently free and offers pit toilets and picnic tables. Camping is limited to fourteen days per year per individual or group. Water is **not** available. Open campfires are **not** permitted.

## Accessibility

 Badlands National Park makes every effort to provide facilities that are accessible to all park visitors. Listed below are some of our accessible facilities and services. A complete listing of accessible facilities is available from the information desk at the Ben Reifel Visitor Center.

- The Ben Reifel Visitor Center and White River Visitor Center are both accessible to wheelchair users. The Touch Room of the Ben Reifel Visitor Center is a tactile experience for all who enjoy handling objects, such as rocks, fossils, and skins, and is appropriate for the visually impaired.
- The Fossil Exhibit Trail and the Door Trail are both accessible to wheelchair users.
- The Cedar Pass Campground has two accessible campsites. The Agate and Group Loop campground restrooms are accessible. One group campsite is accessible.
- The Cedar Pass Lodge dining room and gift shop, as well as some cabins, meet accessibility standards.
- *Buried Fossils, Living Prairie*, the park’s orientation film, is open captioned. Several summer ranger programs, such as the Fossil Talk, are accessible to wheelchair users.

Tent and picnic tables at the Sage Creek Primitive Campground.



BADLANDS

CEDAR PASS LODGE

Full menu dining, air-conditioned cabins, a gift shop, restrooms, a public telephone, bagged ice and recycling are available. In 2004 the lodge is scheduled to open on April 4 and close October 16.

For reservations and rates:


Cedar Pass Lodge  
PO Box 5  
Interior, South Dakota 57750  
Phone: (605) 433-5460  
Website: www.cedarpasslodge.com

2004 Cedar Pass Lodge Operating Schedule			
Lodging	Opens April 4	Closes October 16	
Gift Shop	April 4–May 22	Hours 8 a.m.–5 p.m.	
	May 23–September 1	Hours 7 a.m.–9 p.m.	
	September 2–September 28	Hours 7:30 a.m.–7:30 p.m.	
Dining Room	September 29–October 16	Hours 8:00 a.m.–4:30 p.m.	Closes October 16
	April 15–May 22	Hours 8 a.m.–5 p.m.	
	May 23–September 1	Hours 7 a.m.–9 p.m.	
	September 2–September 28	Hours 7:30 a.m.–7:30 p.m.	
	September 29–October 16	Hours 8:00 a.m.–4:30 p.m.	Closes October 16
Badlands National Park is in the Mountain Time Zone			

2 Prairie Preamble

Hey Kids!


Become a Junior Ranger!



If you are between the ages of 5 and 12, you can earn your Junior Ranger Badge and help protect the Badlands. There are two ways that you can become a Junior Ranger.

During the summer, you can attend the Junior Ranger program given by a park ranger or volunteer. The program includes fun activities to help you learn about the park. Check park bulletin boards or visitor centers for program times. See page 12 of the newspaper for more details.

You can also become a Junior Ranger by completing the activities in the Junior Ranger Booklet. Booklets are available for different age ranges. The booklets can be purchased for \$1.50 at either of the park’s visitor centers. Once you have completed the booklets, bring them to a park visitor center for review. After the ranger approves your work, he or she will sign your certificate and award you a Junior Ranger Badge!





# Visiting the Area



**MOUNT RUSHMORE NATIONAL MEMORIAL**  
Sculptor Gutzon Borglum and his crew carved “The Shrine of Democracy” in the Black Hills from 1927 to 1941. Mount Rushmore National Memorial is located 25 miles south of Rapid City, South Dakota near the town of Keystone. The National Park Pass is not valid for parking fees. For more information, call (605) 574-2523 or visit the website [www.nps.gov/moru](http://www.nps.gov/moru).



**MINUTEMAN MISSILE NATIONAL HISTORIC SITE**  
Minuteman Missile NHS preserves a launch control facility and a nuclear missile silo of a Minuteman II missile system. The park is in the planning stage but may offer limited tours this summer by reservation only. (See article on below). Call the site at 605-433-5552, stop by the Project Office at Exit 131 off of Interstate 90 or visit their website at [www.nps.gov/mimi](http://www.nps.gov/mimi).

**DEVILS TOWER NATIONAL MONUMENT**  
Located in northeastern Wyoming (not shown on map above), Devils Tower National Monument was proclaimed America’s first national monument in 1906. The site protects an 867-foot rock tower and surrounding landscape. For more information contact (307) 467-5283 or visit the website [www.nps.gov/deto](http://www.nps.gov/deto).

**JEWEL CAVE NATIONAL MONUMENT**  
Buried beneath the Black Hills of South Dakota is the underground world of Jewel Cave. This national park is located west of Custer, South Dakota along U.S. Highway 16. Tours of the cave are offered year round and reservations are recommended. For information on tour times, call (605) 673-2288 or check [www.nps.gov/jeca](http://www.nps.gov/jeca).

**WIND CAVE NATIONAL PARK**  
With over 100 miles of mapped underground passageways and 28,295 acres of above ground prairie and forest, Wind Cave is a diverse national park. Tours of the cave allow visitors a chance to experience the underground world. Reservations are recommended. For more information contact (605) 745-4600 or visit the website [www.nps.gov/wica](http://www.nps.gov/wica).

**BLACK HILLS NATIONAL FOREST**  
Recreational opportunities abound on the 1.2 million acres of Black Hills National Forest. The Black Hills include rugged rock formations, canyons, meadows, managed and old growth forests, unique caves, historic mining camps and railroads.

**BUFFALO GAP NATIONAL GRASSLAND**  
Covering over 590,000 acres in southwestern South Dakota, the Buffalo Gap National Grassland is a multiple use area administered by the U.S. Forest Service. The grasslands allow a variety of recreational opportunities including rock hounding, hunting, hiking, biking, off highway vehicle use and horseback riding. Visit the National Grasslands Visitor Center in Wall, South Dakota. Open daily during the summer. You can also phone them at (605) 279-2125.

MOUNT RUSHMORE AND THE BADLANDS MAY BE THE FIRST AREAS visitors think of seeing on travels to western South Dakota, but there are other national parks, forests and grasslands available for recreation and preservation of important resources. Listed below are some of the nearby federally designated sites.

The State of South Dakota has several state parks in the region including Custer and Bear Butte State Parks. For more information on South Dakota State Parks contact (800) 732-5682. Visit the Black Hills Information Center located at Exit 61 on Interstate 90 near Rapid City, South Dakota for information on recreation and travel services in the region.



A view of the Black Hills National Forest near Harney Peak.

## Our New Neighbor: Minuteman Missile NHS

IF YOU ARE LIKE MOST VISITORS, YOU SEEK out national parks to escape the stress of current events. Far from being a peaceful getaway, one of the nation’s newest national parks, Minuteman Missile National Historic Site, brings you up close to an intercontinental ballistic missile (ICBM). Established by Congress in 1999, the park consists of a nuclear missile silo and launch control facility. From this seemingly isolated patch of Midwestern prairie United States Air Force officers could have launched ICBMs at targets in the Soviet Union. With the simple turn of keys, nuclear missiles would have been exchanged with the Soviet Union, making real one of the greatest fears of the 20th Century, nuclear war.

Starting this summer a limited number of visitors, by reservation only, may be guided through the launch control capsule and topside support structures of a Minuteman II launch control facility known as Delta-01. Visitors will be allowed access to an area that, although not secret, was seldom seen by civilians from the time it was completed in 1963. Modified only slightly through its thirty years of continuous service, the site is an excellent example of a Cold War missile system. Operated by crews from nearby Ellsworth Air Force Base, Delta-01 was part of the 44th Missile Wing. Known as missileers, these young men and women had the ability to launch 150 Minuteman II missiles, a small fraction of the 1,000



Park historian Sue Lamie, explains the challenges of guiding visitors into the confined space of the launch control capsule while also protecting visitor safety and site resources.

ICBMs that were once deployed in the upper Great Plains.

In 1991, President George H.W. Bush and Soviet Premier Mikhail Gorbachev signed the Strategic Arms Reduction Treaty (START), placing a limit on the number of ICBMs and outlining a process for the demolition of some existing systems, including the Minuteman II. Long since replaced by the Minuteman III at several other installations, the escalating repair and maintenance costs of the Minuteman II made it a likely choice for deactivation. As the demolition of the 450 sites proceeded, Air Force and National Park Service employees began to work together on preservation of two of the sites. Early recognition of the location’s significance provided a unique opportunity to save intact this important piece of our human history.

Fewer people every year remember the Cold War era, a time when the fear of nuclear apocalypse manifested itself in all aspects of everyday life. Books, movies, television, art and music reflected the impact of the atomic bomb. Death from above – nuclear warheads raining down from the Soviet Union – was considered a very real possibility, leading to debates about fallout shelters, deterrence and mutual assured destruction.

The Cold War is over. Now the task is to understand what it was all about. The technology and structures of Minuteman Missile NHS are just objects that remind us of the many lives that are part of this story. Thousands of men and women of the United States Air Force served around the clock, constantly prepared, should the President so order it, to launch nuclear tipped missiles. Contractors built the sites, finishing three weeks ahead of schedule despite the enormity of the task, labor disputes, and South Dakota’s challenging weather. People in local communities, both for and against the missile sites, lived out their lives in sight of nuclear weapons.

Minuteman Missile NHS is not just significant to the people who lived and served in South Dakota. The Cold War dominated the last half of the 20th century for people all over the globe, and nuclear missiles – along with the mushroom cloud they produced upon detonation – became icons of

the age. Why did we first build the Minuteman missile system? Why was it never used? What would the outcome have been if it had been? Reliance upon missile systems is not yet history, but the Soviet Union, once America’s Cold War enemy, is. The challenge of Minuteman Missile NHS is to gather the stories of the men and women who lived through the Cold War, to further our understanding of a time that current events have made seem both more distant and more relevant than ever before.

*By Sue Lamie, historian at Minuteman Missile National Historic Site.*

Serving a peaceful purpose today, this training version of a Minuteman II ICBM at the Delta 09 missile silo provides visitors a chance to ponder the significance of the Cold War.





# Badlands Art

IMAGINE LIVING IN BADLANDS NATIONAL Park for a month. During this time you could explore remote places, wander up twisting canyons and let your mind be influenced by the wonders of the Badlands. Away from the routine of “real” life, you might find renewed inspiration. If your life’s passion is art, then this scenario could become reality. Artists have had a long-standing impact on America’s national parks. By painting the impressive landscapes of the west in the mid 1800s, visual artists like Albert Bierstadt and George Catlin promoted the wonders of little known western lands to eastern cities. Their work helped stimulate the establishment of many national parks by increasing awareness of wonders like Yellowstone, Yosemite and the Grand Canyon.

Following a tradition started much earlier, Badlands National Park began hosting artists in 1996 through the Artists in Residence Program. Since then, eighteen different artists have been selected by a panel of park employees, often competing with over a dozen other applicants for the chance to live and work at Badlands National Park. Through the Artist in Residence Program, Badlands National Park has hosted painters, photographers, musicians, poets, ceramists, sculptors, printmakers and novelists. Each artist conducts two school pro-

grams and donates one finished product representative of their residency.

Almost 30 other National Park areas, such as Acadia National Park, Denali National Park and Everglades National Park, have similar programs. The National Park Service protects these places that continue to inspire artists and visitors alike. Even if you are not an artist, you can benefit from the Artist in Residence Program by enjoying the artwork. Stop by The Ben Reifel Visitor Center to view the current artwork on display.

*By Julie Johndreau, education specialist and Artist in Residence Coordinator for Badlands National Park.*

*The white place, oil on canvas, by Kathy Hodge, Badlands Artist in Residence, Fall 2002.*



# Your Fees At Work

IN 1997, CONGRESS AUTHORIZED THE FEE demonstration program to address the growing repair and maintenance backlog for interpretation, signage, habitat, facility enhancement and resource preservation projects. Although both tax dollars and entry fees fund national park sites, only tax dollars fund day to day operations of the park. Entry fees fund structural maintenance and other specific projects and are administered through the Recreation Use Fee Demonstration Program.

This federal program, enacted by Congress in 1996, allows individual parks to retain and use entry fees it collects from the public. It is also called the “fee demo program” and projects funded with these monies are identified as “fee use areas.” Until 1996, all collected fees were deposited into the federal treasury and budget allocations were made for each park. Over the years, park visitation increased dramatically but funding did not rise accordingly. Each year, structural maintenance, education and resource management projects fell more and more behind. It became difficult for many parks to carry out their mission to provide a good visitor experience. By redistributing these entry fees, the program achieved a balance between the number of park visitors and associated visitor use costs. Presently, Congress is deciding whether to make the program permanent or to extend it as a pilot program. Under the fee demo program, 80% of the fees collected remain with the collecting park and are applied to specific, approved projects. The remaining 20% of the fees are deposited into the federal treasury and help in funding parks that do not collect fees.

Projects funded by the fee demo program in Badlands National Park include expanded educational programs, wayside and campground restrooms, improved trail

access, relocation of bighorn sheep into the park and reintroduction of threatened or endangered species, management of grassland habitat through prescribed fires and maintenance of visitor facilities. It is this program that enables Badlands to undertake projects that otherwise would not be funded. Out of every \$10 entrance fee, \$5 goes to the Oglala Sioux Tribe under a special agreement with the tribe. Of the remaining \$5, \$1 goes to the Washington office for distribution for service-wide projects and \$4 stays in Badlands National Park for projects here.

- Your fee dollars at Badlands National Park are being used for:**
- Improving the Castle and Medicine Root Trails to enhance visitor safety and protect resources from damage by off-trail travel. New trail markers will be installed, washouts repaired and access at trailheads improved.
  - Continued preparation and curation of fossils from the Big Pig Dig site. Fossils will be available to the research community by funding the construction of a museum collection storage facility.
  - Adding Restroom facilities to the Pinnacles Overlook.
  - Rehabilitating the old sewage lagoons near the Cedar Pass Campground and restoration of the mixed-grass prairie on the site.
  - Replacing the deteriorated fossil casts at Fossil Exhibit Trail to increase the visitor experience on this self-guided nature trail.
  - Providing support for the Weed Management Program.
  - Repairing the park boundary fence to protect resources.
  - Providing interpretive media for park visitors through waysides, bulletin boards, and development of a new park movie to reflect new scientific information and cultural sensitivity.
  - Capture of bighorn sheep in New

National Park Service  
U.S. Department of the Interior

EXPLORE

More

2004

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More than 80% of Pass proceeds go straight into park programs to protect and improve these national treasures — so when you purchase a Pass, you are supporting parks at the same time.

Mexico and transportation to Badlands National Park to enhance the present park population.

- Other projects in the near future include:
- Continued monitoring and study of the park’s bighorn sheep populations. Fee demo funds will be used for further bighorn sheep reintroductions.
  - Development of a Badlands National Park Handbook for visitors.
  - Replacing wayside exhibits along Badlands Loop and Sage Creek Rim Roads.
  - Conversion of the old park radio system to a narrowband digital system.

*By Aaron Kaye, a park ranger at Badlands National Park since 1999.*



Visitors enjoy the view from the Door Trail boardwalk. The original trail was replaced with a boardwalk made of recycled plastic. Funds for this project were a combination of money from the fee demonstration program and grant sources.

# Badlands Books

**Want to learn more about the Badlands area? Check out these books available from the Badlands Natural History Association.** The Badlands Natural History Association operates sales outlets in Badlands National Park at the Ben Reifel and White River Visitor Centers and at the Buffalo Gap National Grasslands Visitor Center in Wall, South Dakota.



**Badlands National Park Official Road Guide**  
**by the National Park Service and R.L. Ruehrwein**

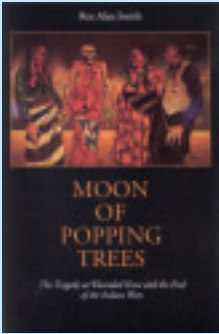
This guide provides an overview of Badlands National Park. It includes information on trails, overlooks along the Badlands Loop Road, park ecology and local history.

Price \$2.00

**Moon of Popping Trees**  
**by Rex Alan Smith**

This book tells the story of the Wounded Knee Tragedy of 1890, including racial attitudes, cultural conflicts, interpretations of treaties, Congressional actions and impact of the press, all of which influenced the events leading up to the Massacre at Wounded Knee.

Price \$12.95





# Pardon Our Progress

VISITORS TO BADLANDS NATIONAL PARK WILL soon notice dramatic changes. One of these will be the renovation of the Ben Reifel Visitor Center. Opened to the public in 1959 when park visitation was 35,000 annually, the Ben Reifel Visitor Center can no longer adequately accommodate the nearly 1 million visitors the park receives each year. Approximately \$2.9 million was appropriated by Congress to upgrade the visitor center so that visitors will have a better understanding of the resources in Badlands National Park.

Designed by architect Cecil M. Doty, the Ben Reifel Visitor Center was constructed during Mission 66. Mission 66 was a program to update and modernize park facilities across the national park system by 1966, the 50th anniversary of the National Park Service. Prior to Mission 66 most park facilities were constructed as rustic or grandiose structures made of natural materials. The Old Faithful Inn at Yellowstone National Park is an example of this early park architectural style.

During Mission 66 new structures departed from the rustic style. The Ben Reifel Visitor Center at Badlands National Park expresses the simple design of many Mission 66 buildings. The low-lying structure blends into the landscape while details in the construction emphasize the building’s relationship with the surrounding environment. The rough texture and color of the bricks was selected and laid in courses to resemble the striated character of the Badlands rock formations. These features of the visitor center will be preserved when the park begins renovations.



When renovations are completed, the Ben Reifel Visitor Center will feature new interactive exhibits on park geology, paleontology, ecology and human history. The redesign will allow for an easier flow of visitors through the facility to an expanded Badlands Natural History Association sales area, a 90-seat auditorium with a new high-definition park movie, new restrooms, a larger orientation and information desk and a classroom for presenting education programs to visitors or school groups. As construction progresses you may encounter some minor inconveniences in the next year,



**above:** Current exhibits in the Ben Reifel Visitor Center. These were installed in 1959.

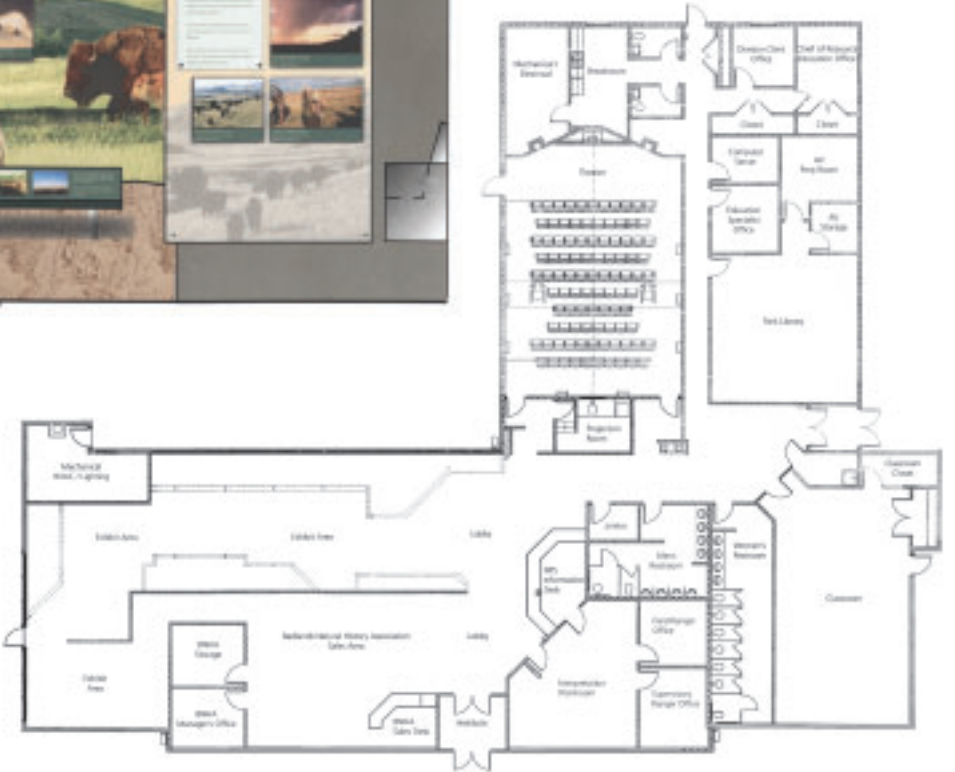
but soon, visitors will have an improved facility to help them enjoy and understand Badlands National Park.

**left:** Concept plan for one of the new exhibits that are currently being designed for the renovated Ben Reifel Visitor Center.

**below:** Floor plan for the renovated Ben Reifel Visitor Center.



**above:** View of the front Ben Reifel Visitor Center.



## Badlands Backcountry

### Backcountry Camping

**Want to walk on the wild side of Badlands National Park?** How about a trip into the park’s backcountry or designated wilderness areas? While most visitors stick to the roads, overlooks, and designated trails, there is more of the park to explore. Over 64,000 acres of the park have been designated by Congress as the Badlands Wilderness Area, a place to remain forever wild. The wilderness is divided into two units. The Sage Creek Unit is the largest. Located in the northwest part of the park, its boundaries follow the park boundaries to the south and west, the Sage Creek Rim Road to the north and the Conata Road to the east. The smaller Conata Unit is located south of the Badlands Loop Road between the Bigfoot Pass Picnic Area and the Conata Road. These areas are shown on the park map you received at the entrance station.

- Before you venture into the backcountry or wilderness, there are some things you should know:
- Permits are not currently required for overnight stays in the Badlands backcountry.
  - Contact a staff member at the Ben Reifel Visitor Center or Pinnacles Ranger Station before setting out on an overnight trip. Backcountry registers are located at the Conata Picnic Area, the Sage Creek Basin Overlook and Sage Creek Campground.
  - Twisted or fractured ankles are the most common serious injury sustained in Badlands National Park. Make sure you are wearing sturdy boots with good ankle support. The park is home to many burrowing animals. Watch your footing.
  - Campfires are **not** allowed under any circumstances. Use a backpacking stove.
  - Pets are **not** permitted on trails, in backcountry or Wilderness Areas.
  - Campsites must be located at least a half mile from a road or trail and must not be visible from a roadway.
  - There is little to no water available in the backcountry. The small amounts of water found are not drinkable or filterable due to the high sediment content. Always carry at least one gallon of water per person per day.
  - All refuse must be carried out. Use the cat hole method to dispose of human waste. Dig a small hole 6 to 8 inches deep and a minimum of 200 feet from any watercourse. Since animals will often dig up cat holes and scatter the toilet paper, it is preferred that you pack out any toilet paper used. If you must bury toilet paper, use a minimal amount and bury with at least 6 inches of soil. Strain food particles from wastewater, pack out food scraps and scatter remaining water more than 200 feet from any stream channel.
  - Check the weather forecast. Severe thunderstorms are common during the summer as are days above 100°F. September and early October are the best backpacking months.

For more on enjoying and protecting the park, see page 6 for Leave No Trace information.

### Horseback Riding and Stock Use

**Horseback riding and stock use is allowed throughout the park except on marked trails, roads, or in developed areas.** The Badlands Wilderness Area south of Sage Creek Primitive Campground is popular with stock users. Hitching posts are located in the campground. A brochure on horse use is available from park staff at the Ben Reifel Visitor Center or Pinnacles Ranger Station.

As for hikers, water is a scarce resource in Badlands National Park. Natural water sources are often full of silt and livestock unaccustomed to the local water will not drink from these sources. If you plan to spend several days in the backcountry, you will need to pack in water for your livestock as well as for yourself.

Certified weed free feed is required in the park to minimize the spread of invasive exotic plants into the prairie ecosystem. Start your horses on the weed free feed several days prior to your trip to Badlands National Park so that seeds will have passed through the digestive tract.

At this time, no guides are licensed to provide trail rides inside the park. Several private operations do provide trail rides on surrounding private land. Inquire at the visitor center for current information on horseback rides.



**After spending a night in the Badlands Wilderness on a Leave No Trace training, Joe Johndreau and Pat Sampson load a pack horse.**



# Leave No Trace

BADLANDS NATIONAL PARK IS VISITED BY OVER ONE MILLION PEOPLE EACH YEAR. WHILE individually our actions may seem small, collectively we can have a dramatic impact on this landscape. When traveling in the park please know and follow the park rules and regulations and practice techniques that will *leave no trace* of your passing. The information below was developed from the seven Leave No Trace Principles. For more information on Leave No Trace, please visit [www.lnt.org](http://www.lnt.org) or call 1-800-332-4100.

## Plan Ahead and Prepare

### Weather

Badlands weather is unpredictable, at best. Prepare for extreme weather. Heavy rain, hail and extremely high winds occur through the summer. Lightning strikes are common. During a severe electrical storm, stay away from exposed places, ridges, or isolated trees.

Summer temperatures often exceed 100°F. Sunscreen, a hat, and water are essential to avoid sunburn, dehydration, and heat stroke. It is also advisable to wear long pants.

### Water

Water found naturally in the Badlands is full of silt and undrinkable. It will quickly clog even the best filter or purifier. Water can be obtained from the Ben Reifel Visitor Center, the Cedar Pass Campground, the Pinnacles Ranger Station and the White River Visitor Center. There is no other potable water available in the park. Always carry water with you. You should carry a minimum of one gallon of water per person per day in the Badlands.

### Cactus and Other Plants

Statistically, the most dangerous park resident is the prickly pear cactus. It causes the highest percentage of our first aid responses by piercing shoes, socks, and gloves. It occurs throughout the park, is quite low to the ground and often under other plants such as grass. Always wear heavy leather boots and long pants when exploring the prairie. Leather gloves are also helpful.

The park has poison ivy in vegetated areas, such as Cliff Shelf Nature Trail. Remember that poison ivy leaves occur in bunches of three. Examples of poison ivy are found in the herbarium in the Ben Reifel Visitor Center.

### Hiking and Backpacking

Keep in mind that Badlands National Park currently has an open backcountry policy. This means that we have no permit system in place and very few established trails. While this offers a wild hiking experience, it also means that there is no registration process allowing for your whereabouts to be known. You are truly on your own and are responsible for your own safety. The park is also full of prairie dog towns, a critical part of the prairie ecosystem. Use care when exploring them to avoid turned ankles or contact with burrow residents. See Page 5 for Backcountry Regulations and Page 7 for Day Hiking Trails.

## Travel and Camp on Durable Surfaces

Seemingly sturdy, the Badlands formations are extremely unstable and unsuitable for any type of rock climbing. Do not attempt technical climbing in the park. Park regulations do permit exploration of the Badlands. However, scrambling up formations and sliding back down creates scars. It also changes the natural erosional patterns, creating human-impacted features. In high-use areas such as the Cliff Shelf and Fossil Exhibit Trails, please stay on the established trails. Serious injuries occur as visitors become disoriented or fearful when attempting to return from off-trail adventures. Be safe. Be low impact. Stay on trails.



Off road travel is **not** allowed for any wheeled vehicles including cars, motorcycles, and bicycles. Travel is limited to established roads. Bicycles are not allowed on the trails, prairie, or formations.

## Dispose of Waste Properly

Please help keep the Badlands clean. Place all garbage in trash containers. If trash cans are not available, please pack out all trash. Recycling bins for metal, glass and plastic are found at the Ben Reifel Visitor Center and Cedar Pass Campground and other park locations. Restrooms are located at the Ben Reifel and White River Visitor Centers and Cedar Pass Campground. Pit toilets are available at other locations.

## Leave What You Find

All collecting in the park is prohibited. Removing, defacing, or destroying any plants, animals, minerals, fossils, rocks or cultural objects is illegal. It also diminishes the park’s resources and other visitors’ experiences. Taking even the smallest rock or picking flowers is punishable by a fine.



## Campfires

Campfires are **not** permitted due to the extreme danger of prairie wild fire. Camp stoves or contained charcoal grills can be used in campgrounds or picnic areas. Backpacking stoves or similar self-contained stoves are preferred and are the only cooking devices permitted in the backcountry. Wood gathering is **not** permitted.

## Respect Wildlife

Viewing wildlife is a popular visitor activity in national parks. Please, keep the *wild* in wildlife. If an animal reacts at all to your presence, you are too close. Do not be lured in by “cute” or “tame” behavior. All wildlife – deer, prairie dogs, bison, snakes and even birds – can cause serious injury.

Unfortunately, almost as popular as viewing wildlife is feeding wildlife. Feeding park wildlife is illegal. Please do not feed any park animals, including birds. Wildlife can become aggressive with humans and dependent on us for their subsistence. They lose their natural instinct to hunt or forage. Most human food is high in sodium, which leads to rapid dehydration and eventual death. Some animals have even been found with styrofoam and plastic in their stomachs during autopsies. Resist temptation. Don’t feed begging animals.

Bison can run 30 miles per hour and may weigh up to 2000 pounds. Bison injure more visitors to national parks each year than bears, wolves, and coyotes combined. They are not simply large stock animals. They are wildlife. Never come within 100 yards of a bison.



Many visitors ask about the park’s only poisonous snake, the **prairie rattlesnake**. Like all snakes, the prairie rattler cannot control its body temperature internally. To survive, it must seek out resting places where temperatures are between 65° - 85°F. Choice hiding spots include under ledges, rocks and shrubbery or in prairie dog burrows. In the evening snakes gravitate toward dark surfaces that retain warmth, such as paved trails, roads and sidewalks. Prairie rattlersnakes usually attempt to avoid humans. Wear long pants and closed toe shoes, and do not place your hands out of sight, such as reaching over a ledge to pull yourself up. Snakes do not have ears. They sense, rather than “hear,” you coming through the vibrations you create on the ground and surrounding vegetation.

Travel at or below the speed limit to protect wildlife. Deer frequently travel in herds of two to ten. If you see one crossing the road, expect more to follow. The most frequent cause of unnatural death to park wildlife is automobiles or recreational vehicles.

## Be Considerate of Other Visitors



Pets are allowed only on paved or gravel roads and in developed areas such as campgrounds and must be kept on a leash at all times. They are not allowed on trails or in public buildings.

Respect other visitors and the quality of their experience. Let nature’s sounds prevail. Avoid loud voices or noises.

## Rules of the Road

**Motorist Warning:** The speed limit in the park is 45 miles per hour unless posted otherwise. Seat belts are required for all passengers at all times.

Drive cautiously and use pull outs to allow others to pass safely or to view wildlife. Do not pull off the road unless there is sufficient pavement for your vehicle to be completely out of the lane of traffic. Do not pull onto grass. The underside of your vehicle can start a prairie fire.

Pedestrians have the right of way. Vehicles must stop for pedestrians in crosswalks. It’s the LAW.

## Bicyclists

**Bicyclist Warning:** The Badlands Loop Road is narrow with many curves. Watch out for large RVs. Bicycles are prohibited on park trails. Bicyclists are permitted on all park paved and unpaved roads and must obey all traffic regulations. Always ride with the flow of the traffic.

See and be seen: wear bright colors and a helmet. A map of suggested routes is available at the information desk of the Ben Reifel Visitor Center.

## Protect Your Park

- Leave fossils, flowers, rocks and animals where you find them.
- Preserve your heritage. Do not enter, alter or deface archeological sites. Do not collect artifacts.
- All vehicles and bicycles must travel on designated roads.
- Stay on designated trails in high-use areas such as Fossil Exhibit and Cliff Shelf Nature Trails.
- Observe the speed limit and watch out for wildlife crossing the roads.

## Protect Yourself

- Drink at least one gallon of water each day.
- During a lightning storm avoid lone trees and high ridges. Return to your vehicle if possible.
- Be careful near cliff edges and on Badlands formations, especially when surfaces are wet.
- Wear clothing and sunscreen to protect yourself from the sun.
- Wear sturdy boots or shoes to protect your feet from cactus spines.



# Hiking in the Park



## Hiking Trails in the North Unit

FOR A CLOSER LOOK AT THE BADLANDS, CONSIDER TAKING A HIKE. THE ENTIRE PARK IS OPEN TO hiking, however, please stay on the trails in high use areas. All of the developed trails start from parking areas within five miles of the Ben Refiel Visitor Center. If you are interested in backpacking overnight, see page 5 or ask at a park visitor center for backpacking information. A topographic map is recommended for all trips into the Badlands Wilderness area.

In planning your hike, consider past, present and forecasted weather. Trails can vary from slick and impassable to dry and dusty or even dry on top and muddy and slick underneath. Always carry water even if you are taking just a short walk. Remember that collecting is not permitted. Help protect your park by leaving rocks, plants, fossils and artifacts where you find them. If you find something that you think is especially significant, leave it in place and report it to staff at the Ben Reifel Visitor Center.

## Hiking in the Stronghold Unit

The Stronghold, or South, Unit of Badlands National Park is located on the Pine Ridge Reservation. Its 122,000 acres are co-managed by the National Park Service and the Oglala Sioux Tribe and were once used by the U.S. Air Force as an aerial bombing range. Today, the area remains littered with unexploded ordnance. The Stronghold Unit is generally roadless. Paths that are found are likely in poor condition or privately used tracks for managing live-stock. You must receive permission to cross private land, even by foot.

Badlands Weather				
Month	Average High Temperature	Average Low Temperature	Record High/Low	Average Precipitation (inches)
May	72°F	46°F	102°F / 20°F	2.75
June	83°F	56°F	109°F / 34°F	3.12
July	92°F	62°F	111°F / 42°F	1.94
August	91°F	61°F	110°F / 35°F	1.45
September	81°F	51°F	105°F / 25°F	1.23
October	68°F	39°F	97°F / 2°F	0.90



## Pet Owners:

Please keep your pet on a leash not longer than six feet at all times (or in a cage). Pets are not allowed on trails, off roads, away from developed campsites or in public buildings. Never leave them unattended at any time. Remember, summer heat is deadly! Do NOT leave your pet alone in a vehicle for even just a few minutes. The temperature in your vehicle can quickly rise to over 150°F. Pets are permitted off roads in the Buffalo Gap National Grassland and in the Black Hills National Forest.

Trail	Round Trip (mi/km) (avg. time)		Description
<b>Door Trail</b> Accessible to viewpoint	.75/1.2	20 minutes	Easy. An accessible ¼ mile boardwalk leads through a break in the Badlands Wall known as “the Door” and to a viewpoint. From there, the maintained trail ends. Travel beyond this point is at your own risk. Watch for drop offs.
<b>Window Trail</b> Accessible with assistance	.25/0.4	20 minutes	Easy. This short trail leads to a natural window in the Badlands Wall with a view of an intricately eroded canyon. <b>Please stay on trail.</b>
<b>Notch Trail</b>	1.5/2.4	1½ -2 hours	Moderate to Strenuous. After meandering through a canyon, this trail climbs a steep ladder and follows a ledge to “the Notch” for a dramatic view of the White River Valley. Trail begins at the south end of the Door and Window parking area. Watch for drop offs. Not recommended for anyone with a fear of heights. Treacherous during or after heavy rains.
<b>Castle Trail</b>	10/16	5 hours	Moderate. The longest trail in the park begins at the Door and Window Parking area and travels 5 miles one way to the Fossil Exhibit Trail. Relatively level, the path passes along some Badlands formations.
<b>Cliff Shelf Nature Trail</b>	0.5/0.8	½ hour	Moderate. This loop trail follows boardwalks and climbs stairs through a juniper grove perched along the Badlands Wall. A small pond occasionally exists in the area and draws wildlife such as deer and bighorn sheep. Climbs approximately 200 feet in elevation. <b>Please stay on trail.</b>
<b>Saddle Pass</b>	0.4/.75	½ -1 hour	Strenuous. This short trail climbs up the Badlands Wall to a view over the White River Valley. The trail ends where it connects with the Castle and Medicine Root Loop Trails.
<b>Medicine Root Loop</b>	4.0/6.4	2 hours	Moderate. This gently rolling spur trail connects with the Castle Trail near the Old Northeast Road or at the intersection of the Castle and Saddle Pass Trails. Trail users are provided the opportunity to explore the mixed-grass prairie while enjoying views of the Badlands in the distance. Watch for cactus.
<b>Fossil Exhibit Trail</b> Accessible	.25/0.4	20 minutes	Easy. This fully accessible trail features fossil replicas and exhibits on extinct creatures that once roamed the area. <b>Please stay on trail.</b>



Weather warnings and forecasts for Badlands National Park and vicinity can be heard on NOAA Weather Radio 162.450 MHZ. Forecasts can also be obtained by calling 605-341-7531.



# Making a Comeback: the Swift Fox

A PRIMARY ROLE FOR NATIONAL PARKS IS TO preserve native ecosystems. In September 2003, thirty swift fox (*vulpes velox*) were released at designated sites throughout the north unit of the park. Swift fox had not been documented in Badlands since 1992. Badlands National Park previously restored other species including bison, bighorn sheep and black-footed ferrets to the mixed-grass prairie. The reintroduction of the swift fox is another important step in assembling the pieces of a diverse ecological puzzle.

The swift fox is one of the smallest wild members of the dog family. Weighing three to five pounds, they stand ten to twelve inches at the shoulder and are eighteen to nineteen inches long excluding the tail. Swift fox are most active at night and den underground during the day. They prefer short to mid height grasses for hunting and denning. Experts believe that shorter vegetation allows them to locate prey and keep an eye out for other predators. As generalist predators, swift fox eat small mammals, prairie dogs, rabbits, hares, birds, insects, some plants and carrion. The greatest causes of mortality for swift foxes are coyotes and cars. They are also preyed upon by owls and other raptors.

Foxes were once abundant on grasslands from Texas to Canada. Through predator and rodent control efforts, conversion of native prairie to agriculture lands and human settlement, swift fox numbers declined dramatically. Native populations still exist in select states, but far below levels of pre-settlement times. Though not considered a federally endangered species, the swift fox



A swift fox suns itself while awaiting release.

is listed as “threatened” by the State of South Dakota because of its absence from most of its historical range in the state.

In recent years, scientists have re-established swift fox in parts of Canada, Montana and South Dakota in an effort to increase their range, enhance genetic diversity and link isolated groups. Fox restoration is a multi-year effort in cooperation with the Turner Endangered Species Fund (TESF), United States Geological Survey-Northern Prairie Wildlife Research Center, the United States Forest Service-Buffalo Gap National Grasslands, the Colorado Division of Wildlife and South Dakota State University. Badlands National Park joined this effort and has completed its first year of reintroductions.

The Badlands swift fox release program is scheduled for three years, followed by an evaluation in 2006. The foxes released in Badlands National Park in 2003 came from south central Colorado. Working with private landowners and the Colorado Division of Wildlife, park biologists captured 30 foxes in August using live-box traps. Each fox was examined, given a series of vaccina-

tions, and tagged with a microchip for identification. Blood was drawn from every animal and sent to the Wyoming State Veterinary Lab for disease screening. Healthy foxes were fitted with a radio transmitter collar and transported to Badlands. Foxes were held in quarantine for fourteen days prior to their release in September.

Thirty more animals will be released in both 2004 and 2005. Continued monitoring of the foxes via radio telemetry and locating animals at den sites will provide biologists with information on animal home range, habitat use, diet, den site selection and reproduction. As of early March 2004, ten of the first thirty foxes released have died (six killed by coyotes, three by cars and one by a snare). Nine moved out of the tracking area and eleven settled in and around the park and are monitored on a regular basis.

The mating season for swift fox in this region is mid March, with pups born in early May. In March 2004, four of the Badlands foxes appear to have found mates, as indicated by the use of common den sites. An additional four animals have been located near one another on a recurring basis. Park biologists hope they will mate and produce pups this spring.

The future of the swift fox is uncertain, but optimistic. Other efforts in South Dakota include a TESF project that was initiated in 2002 on Ted Turner’s Bad River Ranch. Additional animals are to be released on the ranch near Pierre through 2008. The hope is to re-establish populations in the White River Badlands and the Bad River area with the animals eventually linking up to create a

genetically diverse, self-sustaining and stable population.

The Oglala Sioux Tribe has also recently received federal funding to complete a feasibility study on the reintroduction of swift fox to the Pine Ridge Indian Reservation south of Badlands National Park. This study will aide ongoing efforts to increase swift fox numbers.

Continued updates on the status and reproduction of the swift fox at Badlands will be posted in the Ben Reifel Visitor Center or on park bulletin boards. Visitors can assist park biologists by reporting any swift fox sightings in and around the park. Though small and relatively unknown, the swift fox is yet one more native animal returned to the mixed-grass prairie in an effort to restore the original ecosystem.

*By Paul Hansen, a biological technician at Badlands National Park.*

Staring from an artifical den in a holding pen, a swift fox awaits release into the park.



# Tracking the Black-Footed Ferret

MANY HAVE HEARD THE STORY OF THE black-footed ferret, an animal once on the edge of extinction, but then successfully reintroduced into the wild. For the past thirteen years, Badlands National Park has been an active partner in national recovery efforts of the federally endangered black-footed ferret. Working closely with the U.S. Forest Service in the adjacent Buffalo Gap National Grasslands, an experimental population area was established in 1993 at the Conata Basin / Badlands reintroduction site. After six years of experimenting with ferret release strategies, a wild population was established in 1999 and release of captive born ferrets ended. Today the Conata Basin / Badlands reintroduction site is home to the only self-sustaining wild population of black-footed ferrets in the world.

The ferret recovery program provides insight into the process of reintroducing an endangered species. The first step is obtaining legal authority from the U.S. Fish and Wildlife Service, the federal agency in charge of endangered species management. Next, an Environmental Impact Statement (EIS) must be completed. The EIS must show how management decisions and alternative actions may affect the present and future biology, aesthetics, recreation, agriculture, economics, society and culture of the surrounding environment. The Conata Basin / Badlands ferret project completed the EIS process in 1993 with official designation of the site as an “experimental population area.” The experimental designation means that black-footed ferrets

brought here for release and future wild born animals are classified as non-essential and experimental members of an endangered species. This language enables resource managers flexibility in experimental release, capture, translocation and monitoring of black-footed ferrets that is crucial for recovery without the normal legal restrictions applied to endangered species. They still retain protection under the Endangered Species Act, but not the limitations that preclude resource managers from management practices such as trapping, handling or moving the animals.

After completion of the Environmental Impact Statement, designation of the experimental population area and receipt of the required permits from the U.S. Fish and Wildlife Service, we were able to concentrate on the actual reintroductions. Release strategy included preconditioning juvenile ferrets to prairie dog burrows, predator management at the release sites and actual release of animals into the wild. The recovery

program at Badlands was successful, attaining the high survival rate of released and subsequent wild born animals necessary to create a self-sustaining population. As of January 2004, the black-footed ferret population in the Badlands / Conata Basin was estimated at about 270 individuals.

Our success has assisted the national ferret recovery effort by providing a source of ferrets for other recovery sites. Selected young wildborn ferrets are relocated to new habitat areas. In this way, competition for resources is reduced for all animals and survival rates are improved. Partners in our efforts include the Colorado Division of Wildlife and the Cheyenne River Sioux and Rosebud Sioux Tribes.

Though the population at Badlands seems to be thriving, the continued national recovery of the black-footed ferret still faces many challenges. Biomedical research conducted by the Smithsonian Institution and the National Zoo has revealed that some

male black-footed ferrets used in captive breeding programs have an increased percentage of abnormal sperm that will not fertilize eggs. This could lower the production of ferrets available for future releases. This abnormality might be a genetic mutation passed from generation to generation. Further research is being conducted on all reintroduced populations to determine the extent of this abnormality. Another concern is the lack of adequate disease free ferret reintroduction sites in North America. The most devastating of wildlife diseases to black-footed ferrets, and to their main prey source, the black-tailed prairie dog, is sylvatic plague caused by the bacteria *Yersina pestis*. Plague is nearly 100% lethal to prairie dogs once a colony becomes infected. It also passes on to ferrets that eat diseased carcasses. Currently no evidence of plague in South Dakota exists, but it has been detected in Wyoming and Montana. Research into the epidemiology of plague and how to control its spread are priorities for black-footed ferret recovery teams.

The black-footed ferret’s story shows we have made many advances in captive breeding, preconditioning and release of animals into the wild. The long term survival of the species, however, cannot depend on a labor intensive reintroduction process. Ultimately, the fate of the ferret will be determined by the management of its habitat.

*By Doug Albertson, a wildlife biologist with the ferret restoration program since 1996.*

left: In 1994, a captive-bred black-footed ferret awaits release to the Badlands / Conata Basin.



right: An unusual daytime sighting of the normally nocturnal black-footed ferret.





# Managing Badlands Bison

BISON, ALSO KNOWN AS BUFFALO, HAVE LONG been recognized as a signature animal of the Great Plains. Once ranging across much of North America, the population crashed between 1860 and 1905, reducing their numbers from 30 million to only a few hundred individuals. Their near extermination in the late nineteenth century was caused by over-hunting and the conversion of open prairie to pastures for cattle or farms. Today, approximately 300,000 bison are distributed among private herds. About 20,000 bison are found in U.S. and Canadian national parks and wildlife refuges. The recovery of bison throughout North America represents a success story in conservation and restoration biology.



Bison are herded towards the corrals so that blood and genetic samples can be taken. Some individuals will be removed from the herd and given to the Intertribal Bison Cooperative.

Current populations of North American bison were restored largely through animals from private herds owned by U.S. and Canadian ranchers, including one herd from Philip, South Dakota. Only one publicly owned bison herd of 22 animals from Yellowstone National Park may have contributed genetic material to surviving plains bison. In Canada, Wood Buffalo National Park bison numbers fell to 500 native animals before the introduction of 6,000 plains bison to the herd in 1926.

Bison returned as the dominant large herbivore of Badlands National Park in 1963 with

the reintroduction of 25 bison from Theodore Roosevelt National Park in North Dakota and three bison from Fort Niobrara National Wildlife Refuge (NWR) in Nebraska. Twenty additional bison were transplanted to the Badlands in 1983 from Colorado National Monument.

After the original bison restorations in 1963 and 1983, their numbers increased dramatically at Badlands National Park. From 1983 to 1987 extended research was conducted at Badlands and the population peaked at greater than 1000 animals. The current population is regulated when numbers exceed 500 animals. Badlands National Park conducted roundups in 2002 and

2003. Over 130 bison of different ages and sexes were given to the InterTribal Bison Cooperative. The InterTribal Bison Cooperative distributes bison to American Indian tribes throughout the West in their effort to re-establish bison herds on their lands.

Although bison numbers have increased at Badlands National Park over the last few years, major challenges remain in assuring the long-term health and sustainability of this species at both Badlands and other federally managed lands. One factor in bison management is the recent discovery that a number of bison contain evidence of

hybridization with domestic cattle. In most cases, this hybridization can be traced back to the original foundation herds.

Another factor is that all modern federal bison herds exist as relatively small populations that are reproductively isolated from each other. Small populations are susceptible to the loss of genetic diversity. Genetic drift is the loss of rare genes in a population because of the low number of individuals that actually breed and pass on their genetic material to their young. Inbreeding occurs when closely related individuals breed with each other, causing visible abnormalities in their young. Long-term management must address and deal with these issues.

The Department of the Interior is currently studying bison by sampling the federal herds at their fall roundups. So far, over 500 animals have been sampled at Badlands, 750 animals at Theodore Roosevelt National Park and more than 400 animals at Wind Cave National Park. Sampling of 600 animals at Yellowstone and Grand Teton National Parks also occurred. Blood and hair samples were collected and transported to the College of Veterinary Medicine at Texas A&M University for DNA



left: A large male bison is controlled in a squeeze chute so that a researcher can determine age by checking teeth. Other staff are also collecting blood and hair samples for DNA studies.

right: A bison races down the corral chute after being freed.



extraction and archiving. The goal of this study is to help assure the long-term preservation of genetic diversity of healthy plains bison for future generations. Based on this current study, the bison population at the Badlands National Park appears to be free of domestic cattle genetics and have a reasonable degree of genetic diversity.

Researchers believe that Badlands bison are a critical population in insuring the genetic integrity and long-term conservation of this species throughout the federally managed bison populations. Though the day may never come when millions of bison again roam the Great Plains, their presence will be preserved in some pockets of the West.

*By Eddie Childers, a wildlife biologist at Badlands National Park and Dr. Jim Derr from Texas A&M University.*



## Bighorns in the Badlands

WHILE VISITING THE BADLANDS YOU MAY BE suprised to see bighorn sheep. Often considered mountain dwellers, bighorn sheep are also at home in the steep, sparsely vegetated slopes of the Badlands. Bighorn sheep are associated with wild, undisturbed places, yet it is an animal that that has come to rely on wildlife management practices for its survival.

Historically, Audubon bighorn sheep roamed the White River Badlands. Bighorn sheep select a home range on steep slopes and often maintain their ranges for several generations. They feed in early morning and evening, browsing on pockets of vegetation within the badlands, or on the open prairie. Keen eyesight alerts them to predators, and if disturbed they bolt for the safety of steep terrain.

The Audubon bighorn sheep became extinct in 1925 from a combination of factors including introduced diseases from domestic sheep, habitat disturbance and unregu-



Bighorn sheep in the Badlands. Photo Credit: Paul Horsted

lated hunting. Following the mission of the National Park Service, Badlands National Park restores native species whenever feasible. Although the Audubon bighorn sheep is no more, the Rocky Mountain bighorn sheep is a close relative. Some biologists contend that the genetic difference between the Rocky Mountain and Audubon species is so slight that classification as separate species is unwarranted.

In 1964, twenty-two Rocky Mountain bighorn sheep were relocated from the Pikes

Peak area in Colorado to Badlands National Park. From this small reintroduced group, there are now almost 90 bighorns in the park. This population has been monitored for the last 40 years. In the mid 1990s, wildlife biologists at Badlands National Park engaged in a detailed research project on habitat availability and sheep population dynamics. Detailed field observations about plant composition, water availability and terrain type were collected. Blood and fecal samples were sent to labs for analysis. From the data gathered, biologists learned that the park's bighorn sheep were not using all of the available habitat. It was estimated that the Badlands could support up to 300 bighorn sheep. By nature, they do not tend to colonize new areas. Wildlife biologists and resource managers stepped in to help in 1996. Sixteen bighorn sheep from the west side of the park were captured. These sheep were moved to the Cedar Pass area, near the Ben Reifel Visitor Center and park headquarters.

Despite these efforts, the park's bighorn sheep population is still relatively small, and biologists are skeptical whether Badlands bighorns have the ability to persist over time. Any population needs genetic diversity and sufficient numbers to reproduce and survive catastrophic events such as disease outbreaks. A population of 300 animals would help the bighorn sheep become self sustaining. The park plans to reintroduce additional sheep from New Mexico and other parts of South Dakota in fall 2004. Such large scale wildlife management projects rely on cooperative agreements between different federal, state and private agencies.

Perhaps on your drive through the Badlands you will get a glimpse of the elusive bighorn sheep. They are a symbol not only of wildness, but also the complexity of managing wildlife in the 21<sup>st</sup> century.

*By Julie Johndreau, education specialist at Badlands National Park.*



# Protecting Fossil Resources

WHEN BADLANDS NATIONAL MONUMENT was authorized by Congress in 1929, a report accompanying the park’s enabling legislation spoke of the area’s fossil resources as a primary purpose for the proposed park. The report cited “vast beds of vertebrate fossil remains...which appear in great variety. The whole area is a vast storehouse of the biological past and for three-quarters of a century (since 1847) it has been the scene for scientific expeditions from all parts of the world.” The White River Badlands contain what many scientists believe are the richest know beds of fossilized mammal remains from the Oligocene Epoch, approximately 25-34 million years ago.

One would assume that if fossils have survived for over 30 million years, they wouldn’t require much help from the National Park Service to stay intact. When the layers of rock that formed the Badlands were being deposited, rivers carried sediments from the rising Black Hills and quickly buried plants and animals, protecting the remains from oxidation and bacterial decay. This allowed the replacement of the bone material with mineral, also known as fossilization, to occur. But today, the Badlands are a changing landscape with erosion occurring at a rapid pace. Cycles of freeze and thaw and run off from melting



**left:** South Dakota School of Mines graduate Cayce Lillesve excavates for fossils. Photo Credit: South Dakota School of Mines and Technology.

**right:** South Dakota School of Mines graduate student Gerald Mundt maps out the location of fossils uncovered at the Pig Dig. Photo Credit: South Dakota School of Mines and Technology.

snow, spring rains or summer thunderstorms expose fossils on the surface. Fossils are then vulnerable to the elements, causing them to break down into small fragments.

Besides the threat of erosion, fossils also need protection from vandalism and theft. Not everyone views fossil resources as a source of scientific information. Fossils are often seen as art objects and valuable tools for investment. The growing global fossil trade has spurred a great temptation to steal fossils from public and private lands. Recent sales of large ticket fossils have placed increased pressure on law enforcement officials to crack down on fossil poaching. Legislation has been proposed in Congress to provide greater protection for fossils on public lands but has not been enacted.

The only way to provide protection for fossil resources is to actively document and collect scientifically significant fossils. The staff at Badlands National Park works in partnership with the paleontological research community in documenting and collecting the great numbers of fossils

## 10 Prairie Preamble

found in the park. Fossils collected during the summer field season are prepared, curated and stored at cooperating museums, where they are available to other researchers and to the general public. Since the year 2000, Badlands paleontologists have surveyed new paleontological localities in the park recording much of this information into the park’s Geographical Information System (GIS) database.

Over the last ten years, the staff at Badlands National Park has worked in partnership to develop several programs to protect fossils. One of these programs will begin again in June 2004 when National Park Service staff working in close cooperation with students and faculty from the South Dakota School of Mines and Technology open the Big Pig Dig fossil excavation for its 11th field season. A wide variety of fossil mammals have been discovered at the site, including three-toed horses, ancient rhinoceros and the pig-like mammal, *Archaeotherium*. More recent discoveries include saber-tooth cats and oreodonts (sheep-like mammal). Based on a detailed analysis of the surrounding sediments, the site is believed to be an ancient watering hole where animals congregated during times of drought.

Also in summer 2004, field-mapping teams will be working in the Cedar Pass area,



documenting new fossil sites that have been exposed. Studies in this area are very important because the fossils provide important clues to the origin of our modern prairie ecosystem. Research groups will evaluate individual fossil sites, rock layers and the ancient environment in which the fossils were preserved.

In another project, the National Park Service is currently working with the Oglala Sioux Tribe to conduct monitoring and possibly excavation of a rich fossil site containing titanotheres. Roaming North America 35 million years ago, titanotheres were the size of small elephants and had large bony projections extending from their snouts. The titanotheres site has been heavily vandalized and there is concern that the remaining fossils could be stolen or damaged before excavation occurs. Scientists are interested in how these ancient skeletons were preserved and what types of ancient environments existed here 35 million years ago. This fossil site lies in the South Unit of Badlands National Park, on the Pine Ridge Indian Reservation. The National Park Service, through a Memorandum of Agreement, co-manages the South Unit with the Oglala Sioux tribe. Many of the fossil sites within the South Unit are also considered sacred by the Lakota people. The staff at Badlands National Park is exploring ways to respect the concerns of tribal members regarding sacred sites while also protecting this valuable fossil resource.



**left:** Dan Lien creates a protective plaster cast around a fossil specimen before its removal from the Pig Dig. Photo Credit: South Dakota School of Mines and Technology Office of University and Public Relations.

**right:** At the South Dakota School of Mines and Technology paleontology lab, student Lorin King completes the detailed task of removing a small fossil from the surrounding rock.

Protection and study of fossils is important because fossils provide many important clues about how the earth and its inhabitants have changed through time. Because animals and plants are always adapting to climatic change, their fossilized remains can be important indicators of ancient climates. Fossils from the Badlands provide evidence of a cooling and drying trend that began over 34 million years ago, leading to the development of the modern prairie. Fossils also provide valuable clues as to the origins of living plants and animals.

Park visitors play an important role in fossil resource protection. If you find a fossil, do not remove or damage the specimen. A fossil removed without proper documentation loses most of its scientific value. Carefully record detailed locality information on a map or GPS unit, if you have one. Carefully describe how to find the site in relation to a known trail or road. Report your find to a ranger or at the Visitor Center.

Park staff, the research community and the public all work as partners in the protection of fossil resources. It is only through careful documentation, excavation and education that these irreplaceable resources will be preserved.

By park paleontologist Dr. Rachel Benton, who has worked at Badlands National Park since 1994.

It appears that this summer will be the last field season at the Pig Dig due to the difficulty in obtaining funds for this project. When the season wraps up in August 2004, the staffs at Badlands National Park and the South Dakota School of Mines and Technology will have enjoyed 11 very productive field seasons, collecting well over 8,000 bones and greeting over 50,000 visitors! Several important research studies have been generated from the site and and curated, more studies will continue. The Pig the National Park Service Natural Resources Preservation Program, the National Park Foundation, the Canon Corporation, Badlands Natural History Association and the National Park Service Fee Demonstration Program.

### Last Year for the Pig Dig!

Visitors can obtain directions to the Pig Dig site by contacting a ranger at the visitor center. The site is open to the public from 9:00 AM to 5:00 PM, seven days a week from early June to late August. Site interpreters greet visitors and describe many of the tasks that are being completed at the site. The site is closed during inclement weather.



**above:** Paleontologist Mike Greenwald catalogs, studies and monitors Badlands fossils housed at the South Dakota School of Mines and Technology.



**above:** Fossils are often associated with dinosaurs on display in museums, but many Badlands fossils are from small mammals like this Proscalops skull.



# Keeping Tabs on Air Quality

VISITORS TO BADLANDS NATIONAL PARK ARE often awestruck by the vast, open vistas awaiting them along South Dakota Highway 240 through the park. In fact, much of western South Dakota gives a sense of endless prairie and immense sky in all directions. The seemingly infinite expanses of grass and sky engulf visitors unfamiliar with the prairie landscape and often instill feelings of smallness and insignificance. Congress touched on this profound feeling when establishing the park. They described “a vast area of rutted ravines, high ridges, hills and cliffs ...extending as far as the eye can reach” with “a continuous serrated skyline series of towers, pinnacles and precipitous gulches ...which cannot be duplicated elsewhere.” Later, passage of the Clean Air Act and designation of a large portion of the park as wilderness required the most stringent protection of air quality. The Clean Air Act gave legal recognition of the importance of clean, clear skies over Badlands National Park.

While people are often taken by the grand views, few stop to think about the purity and clarity of the air which may allow them to see 50 miles or more from park overlooks. On days when there is haze in the air from fires, windblown dust, fog or snowfall, the reduction in visibility is striking. Without clean, clear air the feeling of vastness is lost. Besides affecting visibility, airborne pollutants can harm the park’s plants and animals, as well as the health of visitors breathing the air. Protecting air quality is a challenging task because impacts to our air often come from well outside park boundaries.

To help protect our air, Badlands National Park participates in a nationwide program of air quality monitoring. Changes to our air quality come from particulate matter (dust and airborne solids), ozone (car exhaust and other emissions), or chemicals (energy production). Such monitoring helps park managers ensure that the National Park Service is meeting its mandate to protect the park’s air quality and also facilitates tracking of regional and national air quality trends. As a Class I area under the Clean Air Act, the air quality in Badlands National Park must be as clean as any air in the land.

The National Park Service and Badlands National Park are participants in the Inter-agency Monitoring of Protected Visual Environments (IMPROVE) air quality monitoring network with the Environmental Protection Agency and federal and state land managers. The objectives of the IMPROVE program are to establish current air quality conditions in mandatory Class I areas (national parks and wilderness areas), identify emission sources responsible for visibility impairment and document long-term trends of visibility in Class I areas.

Badlands National Park monitors three specific types of air pollution. First, we measure the loss of visibility from haze or particulate pollution with a transmissometer. A transmissometer consists of a light transmitter and receiver placed across an open space from each other. The light is of a known quantity, so any reduction from refraction or absorption by particles in the air is recorded by the receiver. The hazier the air, the less light reaches the receiver.



*left:* Pat Sampson records data from the transmissometer for the park’s air quality monitoring program.



*right:* View from Big Badlands Overlook showing the exceptional air quality of Badlands National Park.

Trends over weeks, months and years can be identified from this data.

The second type of monitoring is for chemical pollution. Air is filtered for components, such as nitrates, lead, sulfur and carbons. These pollutants can often be traced to their sources. With the current emphasis on development of new energy sources such as power plants, it is important to know what may result from these new sites and monitor air quality after the sources are built.

The third, and newest, component of Badlands air quality monitoring measures ozone levels. Ozone is the principal component of urban smog and is highly toxic to plants. It is particularly damaging to crops

and native plants but can have impacts far from the source. Ozone is not produced directly by smokestacks or vehicles, but is the result of emissions reacting in sunlight.

Badlands National Park is using the best available science to monitor its air quality and contribute to the nationwide system of monitoring air quality trends. By protecting our air, Badlands National Park not only preserves the health of native plants and animals, but also allows future generations of visitors to view “a vast area of rutted ravines, high ridges, hills and cliffs ...extending as far as the eye can reach.”

*By Brian Kenner, chief of natural resource management at Badlands National Park*

## Fire on the Prairie

THE FORCES THAT SHAPED THE VEGETATION of the Great Plains were drought, grazing and fire. Remove or alter any of those forces and the prairie will change. Fire, in particular, played a significant role. Created by both early American Indians and natural causes such as lightning, wildfires cleared the prairie of trees and burned away dead grasses. Vital nutrients returned to the soil and open spaces were maintained. Wildfires improved grazing for wildlife as nutrient rich new grass returned after fires.

The role of fire changed forever when settlers arrived on the Great Plains. Viewed as a threat to life and property, all fires were suppressed. Dead vegetation accumulated. Over the years, that accumulation of dead grass became compacted into a thick thatch that choked out new grass shoots. Exotic plants, species not originally native to the prairie, took hold and spread. Some exotics such as Canada thistle can dominate the landscape and choke out native plants, further altering the prairie ecosystem.

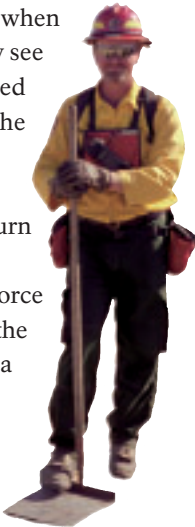
Part of the role of a national park is to preserve the natural processes that created the ecosystem we see today. Since bison only have access to graze a small portion of the park and domestic cattle grazing is not allowed, fire is one tool we have to influence the vegetation at Badlands National Park. Grass is dependent on some type of disturbance to keep it healthy. Fires in the spring also help control exotic plants.

Badlands National Park has a Fire Management Plan that directs the park to burn between one to five thousand acres per year. The park has been divided into 22 burn units, which are burned every five to ten years. In 2004, the fire managers are planning to carry out prescribed burns on approximately 2,200 acres.

Many factors determine whether a prescribed fire will be conducted. Weather is one factor, including forecasted precipitation, wind and humidity. Another important factor is the availability of sufficient staff to conduct the burn safely. Safety for surrounding private property is another important consideration. Fire breaks around the burn site are created by mowing or with fire retardant foam.

Today, Badlands National Park uses fire to mimic nature in restoring the native prairie ecosystem. Depending on when you visit the park, you may see smoke, encounter blackened areas or perhaps observe the vibrant green of new grass covering the burned sites. You are witnessing the return of a key component of the prairie ecosystem. Fire, a force that shaped the prairie of the past, is once again playing a role in its future.

*By Mike Carlbom, fire coordinator for Badlands National Park.*



## Badlands History

AT FIRST GLANCE THE BADLANDS APPEAR to be a harsh place. Summer heat reaches over 110°F and winter cold dips to -42°F. Drinking water is scarce and the land looks inhospitable. Yet, throughout time, many people have called the Badlands home. Archeological evidence hints at the extent of this human story and provides tangible clues of the area’s use. Stone tools, butchered bison bones, fire pits, ceramics and historic homesteads tell us there is a human story that we have only begun to discover.

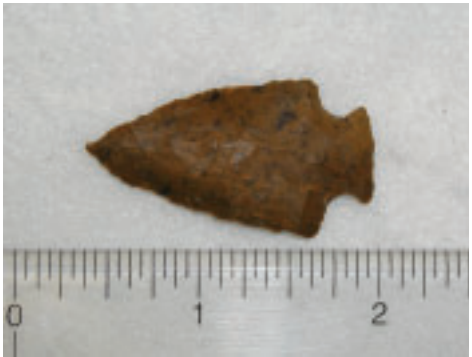
Finding cultural resources in the park is difficult due to the prairie vegetation and rapidly eroding landscape. It is believed the Great Plains has supported human activity for the past 10,000 years. Only recently, we have begun to identify and manage local cultural resources with the assistance of the Midwest Archaeological Center and Augustana College in Sioux Falls, South Dakota.

Discovery of points, fire remains and bones indicate prehistoric, Paleo-Indian peoples were primarily nomadic big game hunters. As the large game of the ice ages died out these people switched to hunting bison. With the arrival of the horse and new technologies such as firearms and metal, modern Indian groups like the Lakota (or Sioux) moved onto the Great Plains. Next into the area came fur traders, mountain men and

explorers into the area in the mid 1700s. By the late 1800s, homesteaders arrived but the climate of the area eventually forced most to leave or shift to ranching. In the early 1900s the Cedar Pass Lodge provided visitors with a place to stay and play in the Badlands. In 1939 efforts by Ben Millard and Peter Norbeck helped establish Badlands National Monument, later expanded to a national park in 1978.

Each group of people has left behind evidence of their stay in the Badlands. Archeology, the study of human cultures, assists park staff to identify and manage this evidence. Cultural resources in the park are protected. If you discover any objects, leave them where found, remember the location and report your discovery to a park ranger. Research and knowledge of our cultural sites helps park staff better understand and tell the human story of the Badlands.

*By Aaron Kaye, park ranger at Badlands National Park.*






A chert projectile point found in the North Unit of Badlands National Park during archeological surveys.




# Ranger Programs

 = accessible


Programs are presented at the Cedar Pass Campground, Ben Reifel Visitor Center or at overlooks or trails throughout the park. You can find program locations by watching for white signs announcing programs along the Loop Road. For information on program times and dates, check park bulletin boards or stop by a park visitor center. Additional programs may also be available depending on staffing availability. **Please remember that Badlands National Park is in the Mountain Time Zone.**

Program Descriptions	
<div><b>Geology Walk</b></div> <div>Learn about the geologic story of the White River Badlands on this 1-hour walk. Meet at the Door Trailhead, located at the far east end of the Door/Window Parking Area one mile south of the Northeast Entrance Station on the Badlands Loop Road. <b>Wear a hat and closed-toe shoes.</b> Terrain is varied.</div>	
<div><div><b>Fossil Talk</b></div><div></div><div>Find out how fossils can tell us the story of ancient life in the Badlands and why they should be protected at this 15–20 minute talk. Presented at the Fossil Exhibit Trail, 5 miles northwest of the Ben Reifel Visitor Center on the Badlands Loop Road.</div></div>	
<div><b>Junior Ranger Program</b></div> <div>Calling all visitors between 5 and 12 years of age! Meet at the shelter at the Cedar Pass Campground Amphitheater parking lot for a 45-minute adventure into an aspect of the Badlands. <b>Wear closed-toe shoes and a hat.</b> It may be a walk, a game, or another activity. Attendees will be awarded a Junior Ranger badge. Parents are also welcome!</div>	
<div><b>Prairie Walk</b></div> <div>Explore the diversity of the mixed-grass prairie at Badlands National Park. Meet in front of the Ben Reifel Visitor Center for an easy, ½ mile, 1-hour exploration. <b>Wear closed-toe shoes and bring a hat.</b></div>	
<div><div><b>Evening Program</b></div><div></div><div>Join a park ranger for a 40-minute slide presentation on an aspect of Badlands National Park at the Cedar Pass Campground Amphitheater. Topics will vary.</div></div>	

National Park Service  
U.S. Department of the Interior



Badlands National Park



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Funding for the 2004 Prairie Preamble is provided by the Badlands Natural History Association. Printing was done by Shakopee Valley Printing in Shakopee, MN.



## Program Cancellations

The Badlands are famous for lightning storms. If lightning is visible from the program location, the program will be cancelled for employee and visitor safety. Programs are typically not cancelled due to rain. Be prepared for changing weather conditions. Programs may also be cancelled due to staffing shortages caused by wildland fire or search and rescue call outs.

Area Services

**Cactus Flat (Interstate 90, Exit 131)**  
Food, gas, sundries, camping, lodging, Minuteman Missile NHS project office.

**Interior (2 miles west of Cedar Pass)**  
Food, gas, sundries, lodging, camping, post office, mechanic, church services.

**Scenic (along SD HWY 44)**  
Gas, sundries

**Wall (Interstate 90, Exit 110)**  
Food, gas, sundries, lodging, camping, post office, mechanic, church services, bank with ATM, medical clinic.

Our 2004 staff is made up of permanent and seasonal park rangers and volunteer interns from universities and colleges across the country. Interns will wear the patch of their sponsoring organization. For more information on internships, call (605) 433-5245 or send an email to **badl\_internships@nps.gov** and request information on internships or volunteer positions.

# Badlands Natural History Association

The Badlands Natural History Association, or BNHA, was established in 1959 to work in cooperation with the National Park Service in furthering its scientific, educational, historical and interpretive activities. Since then, BNHA has contributed over \$1 million to the park. Sales of BNHA items in park visitor centers result in donations to the park’s education and resource management programs.

BNHA is a nonprofit organization that has an active membership program. To become a member of BNHA, get a flyer from any park visitor center, call BNHA at (605) 433 – 5489 or fill out the form. Members receive a 15% discount on all sales of BNHA materials and will often receive a discount at other National Park Service bookstores.

By joining the Badlands Natural History Association you will help preserve the legacy of Badlands National Park. Your membership dues are directly used to enhance the experience of visitors to the area. An investment in the future, your contribution is a perpetuation of the national park idea.



Your membership dues will be gratefully received, immediately acknowledged and efficiently used. Your membership dues are tax-deductible.

☐ Individual Association Membership \$25 per person per calendar year. Includes membership card allowing you a 15% discount at BNHA stores and discounts with other cooperating associations in the U.S. and special mailings through the year.

☐ Lifetime Membership \$250 per person. Includes membership card allowing you a 15% discount at BNHA stores and discounts with other cooperating associations in the U.S. and special mailings.

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